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National Institute of Standards and Technology



## FIPS PUB 127-1

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FEDERAL INFORMATION PROCESSING STANDARDS PUBLICATION  
(Supersedes FIPS PUB 127 – 1987 March 10)

# DATABASE LANGUAGE SQL

CATEGORY: SOFTWARE STANDARD

SUBCATEGORY: DATABASE

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TECHNOLOGY  
Research Information Center  
Gaithersburg, MD 20899

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National Computer Systems Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899

Issued February 2, 1990



U.S. Department of Commerce  
Robert A. Mosbacher, Secretary  
National Institute of Standards  
and Technology  
Raymond G. Kammer, Acting Director

## Foreword

The Federal Information Processing Standards Publication Series of the National Institute of Standards and Technology (NIST) is the official publication relating to standards and guidelines adopted and promulgated under the provisions of Section 111(d) of the Federal Property and Administrative Services Act of 1949 as amended by the Computer Security Act of 1987, Public Law 100-235. These mandates have given the Secretary of Commerce and NIST important responsibilities for improving the utilization and management of computer and related telecommunications systems in the Federal Government. The NIST through its National Computer Systems Laboratory provides leadership, technical guidance, and coordination of Government efforts in the development of standards and guidelines in these areas.

Comments concerning Federal Information Processing Standards Publications are welcomed and should be addressed to the Director, National Computer Systems Laboratory, National Institute of Standards and Technology, Gaithersburg, MD 20899.

James H. Burrows, Director  
National Computer Systems  
Laboratory

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## Abstract

This publication announces adoption of American National Standard Database Language SQL with Integrity Enhancement, ANSI X3.135-1989, and American National Standard Database Language Embedded SQL, ANSI X3.168-1989, as the Federal Information Processing Standard for Database Language SQL (FIPS SQL).

This publication is a revision of FIPS PUB 127 that offers new conformance alternatives, new programming language interfaces, a new integrity enhancement option, clarification and correction of existing specifications, and additional considerations for use in procurements. This revision supersedes FIPS PUB 127. It does not contain any new requirements that would make an existing conforming implementation nonconforming.

The purpose of FIPS SQL is to promote portability of database application programs and programmers among different installations. The standard is used by implementors as the reference authority in developing a FIPS conforming relational model database management system and by application programmers to help write SQL conforming applications.

**Key words:** ANSI standard; data manipulation language; database; database language standard; Embedded SQL; Federal Information Processing Standard (FIPS); ISO standard; module language; schema definition language; software; Structured Query Language (SQL).

# Federal Information Processing Standards Publication 127-1

1990 February 2

## Announcing the Standard for DATABASE LANGUAGE SQL

Federal Information Processing Standards Publications (FIPS PUBS) are issued by the National Institute of Standards and Technology after approval by the Secretary of Commerce pursuant to Section 111(d) of the Federal Property and Administrative Services Act of 1949 as amended by the Computer Security Act of 1987, Public Law 100-235.

**1. Name of Standard.** Database Language SQL (FIPS PUB 127-1).

**2. Category of Standard.** Software Standard, Database.

**3. Explanation.** This publication is a revision of FIPS PUB 127 and supersedes FIPS PUB 127 in its entirety. FIPS PUB 127-1 offers new conformance alternatives, new programming language interfaces, a new integrity enhancement option, clarification and correction of existing specifications, and additional considerations for use in procurements. It does not contain any new requirements that would make an existing conforming implementation nonconforming.

This publication announces adoption of American National Standard Database Language SQL with Integrity Enhancement, ANSI X3.135-1989, and American National Standard Database Language Embedded SQL, ANSI X3.168-1989, as the Federal Information Processing Standard for Database Language SQL (FIPS SQL). The exact specifications are explained in section 10 of this standard.

ANSI X3.135-1989 is a revision of ANSI X3.135-1986 that specifies syntax and semantics of SQL language interfaces for defining and accessing SQL databases. These interfaces include:

- A schema definition language, for declaring the structures and integrity constraints of a database.
- A module language, including SQL statements, for declaring the database procedures and executable statements of a specific database application. The module language specification includes language bindings for programming languages COBOL, FORTRAN, Pascal, or PL/I.

ANSI X3.135-1989 includes an addendum to ANSI X3.135-1986 that specifies an optional “integrity enhancement” feature. This feature includes referential integrity constraints, check clauses, and default clauses.

ANSI X3.135-1989 also includes various clarifications and correction of several errors known to exist in the ANSI X3.135-1986 specification. ANSI X3.168-1989 specifies embedded syntax for inserting SQL statements into application programs. It includes module language bindings for programming languages Ada or C, and specifies embedded syntax for inserting SQL statements into programming languages Ada, C, COBOL, FORTRAN, Pascal, or PL/I.

The purpose of FIPS SQL is to promote portability of database application programs and programmers among different installations. The standard is used by implementors as the reference authority in developing a FIPS conforming relational model database management system, with standard programming language interfaces to that database management system. The standard is used by application programmers to help write SQL conforming applications and by other computer professionals who need to know the precise syntactic and semantic rules of Database Language SQL.

**4. Approving Authority.** Secretary of Commerce.

**5. Maintenance Agency.** Department of Commerce, National Institute of Standards and Technology (National Computer Systems Laboratory).



## 6. Cross Index.

- a. American National Standard Database Language SQL with Integrity Enhancement, ANSI X3.135-1989 (revision of ANSI X3.135-1986).
- b. American National Standard Database Language Embedded SQL, ANSI X3.168-1989.
- c. ISO 9075-1989, Database Language SQL with Integrity Enhancement (revision of ISO 9075-1987).

## 7. Related Documents.

- a. Federal Information Resources Management Regulation 201-39, Acquisition of Federal Information Processing Resources by Contracting.
- b. Federal Information Processing Standards Publication 124, Guideline on Functional Specifications for Database Management Systems, September 1986.
- c. Federal Information Processing Standards Publication 110, Guideline for Choosing a Data Management Approach, December 1984.
- d. NBS Special Publication 500-108, Guide on Data Models in the Selection and Use of Database Management Systems, January 1984.

**8. Objectives.** Federal standards for database management systems permit Federal departments and agencies to exercise more effective control over the production, management, and use of the Government's information resources. The primary objectives of Federal database management system standards are:

- to encourage more effective utilization and management of database application programmers by ensuring that skills acquired on one job are transportable to other jobs, thereby reducing the cost of database programmer retraining.
- to reduce overall software costs by making it easier and less expensive to maintain database definitions and database application programs and to transfer these definitions and programs among different computers and database management systems, including replacement database management systems.
- to reduce the cost of software development by achieving increased database application programmer productivity through the understanding and use of database methods employing standard structures and operations, standard data types, standard constraints, and standard interfaces to programming languages.
- to protect the software assets of the Federal government by ensuring to the maximal feasible extent that Federal database management system standards are technically sound and that subsequent revisions are compatible with the installed base.

Government-wide attainment of the above objectives depends upon the widespread availability and use of comprehensive and precise standard database management system specifications.

## 9. Applicability.

a. Federal standards for database management systems should be used for computer database applications and programs that are either developed or acquired for government use. The Database Language SQL is one of the database management system standards provided for use by all Federal departments and agencies. The Database Language SQL is suited for use in database applications that employ the relational data model. The relational data model is appropriate for applications requiring flexibility in the data structures and access paths of the database. The relational data model is desirable where there is a substantial need for ad hoc data manipulation by end users who are not computer professionals, in addition to the need for access by applications under production control.

Although this standard does not specifically address interactive database access through fourth generation languages, the SQL statements specified by this standard are appropriate for such use. This standard may be used to define the syntax and semantics of database access from such fourth generation languages.

Although this standard does not specifically address distributed database applications, it may be used, along with facilities for remote database access and/or distributed transaction processing, to access relational structured data at remote nodes in a distributed system.

b. The use of FIPS database languages is strongly recommended for database applications when one or more of the following situations exist:

- It is anticipated that the life of the database application will be longer than the life of the presently utilized equipment or database management system, if any.
- The database application is under constant review for updating of the specifications, and changes may result frequently.
- The database application is being designed and developed centrally for a decentralized system that employs computers of different makes and models or database software acquired from a different vendor.
- The database application will or might be run under a database management system other than that for which the database application is initially written.
- The database application is to be understood and maintained by programmers other than the original ones.
- The database application is or is likely to be used by organizations outside the Federal government (i.e., State and local governments, and others).

c. Nonstandard language features should be used only when the needed operation or function cannot reasonably be implemented with the standard features alone. A needed language feature not provided by the FIPS database languages should, to the extent possible, be acquired as part of an otherwise FIPS conforming database management system. Although nonstandard language features can be very useful, it should be recognized that their use may make the interchange of programs and future conversion to a revised standard or replacement database management system more difficult and costly.

d. It is recognized that programmatic requirements may be more economically and efficiently satisfied through the use of a database management system employing a different data model than those provided by the FIPS database languages or the use of a database management system that functionally conforms to a FIPS database language but does not conform to all other aspects of the FIPS. The use of any facility should be considered in the context of system life, system cost, data integrity, and the potential for data sharing.

e. Programmatic requirements may be more economically and efficiently satisfied by the use of automatic program generators or by database access through other high-level language information processing systems. However, if the final output of a program generator or high-level language system is language that accesses a relational database, then that language should conform to the conditions and specifications of SQL.

## 10. Specifications.

**10.1 Adoption of ANSI SQL Specifications.** FIPS SQL includes all provisions from ANSI X3.135-1989, Database Language SQL with Integrity Enhancement, and ANSI X3.168-1989, Database Language Embedded SQL, with the following exceptions:

a. FIPS SQL does not recognize Level 1 of ANSI SQL or partial conformance to just DDL or DML. Instead, the FIPS SQL specification is for "Full SQL conformance to level 2" as specified in section 3.4 of X3.135-1989.

b. FIPS SQL does not include PL/I language bindings, since PL/I is not a FIPS programming language.

c. FIPS SQL does not recognize conformance solely by "direct invocation of SQL data manipulation language statements" as specified in section 3.4 of X3.135-1989, because that concept is not adequately specified in ANSI SQL and implementations cannot be tested for conformance. Conformance to FIPS SQL requires a Module Language or Embedded SQL interface to one or more FIPS programming languages.

d. FIPS SQL includes a "FIPS Flagger" requirement as specified below.



**10.2 FIPS Flagger.** An implementation that provides additional facilities not specified by this standard shall also provide an option to flag nonconforming SQL language or conforming SQL language that may be processed in a nonconforming manner.

a. ANSI SQL allows a conforming implementation to provide facilities beyond those specified in the standard. The following paragraph appears in section 3.4 of ANSI X3.135-1989:

“A conforming implementation may provide additional facilities or options not specified by this standard. An implementation remains conforming even if it provides user options to process nonconforming SQL language or to process conforming SQL language in a nonconforming manner.”

The FIPS Flagger is included in FIPS SQL in order to assist application programmers in developing portable application programs. It allows informed use of implementor extensions when they are appropriate (see paragraph 9c).

b. The FIPS Flagger is intended to effect a static check of SQL language. Normally this check is applied at syntax compilation time, but for interpreted SQL language it can be enforced when the SQL language is interpreted by the implementation. There is no requirement to detect extensions that cannot be determined until execution time.

c. An implementation need only flag SQL language that is not otherwise in error as far as that implementation is concerned. An implementation may choose to check SQL language in two steps; first through its normal syntax analyzer and secondly through the flagger. The first step produces error messages for nonstandard SQL language that the implementation cannot process or recognize. The second step produces flagger messages for nonstandard SQL language that it could process. Any such two-step process should be transparent to the end user.

d. Any SQL language that violates Format or Syntax Rules, except privilege enforcement rules, is an extension and must be flagged.

e. The granularity of extension detection shall be no coarser than at the statement level. If a system is processing SQL language that contains errors, then it may be very difficult within a single statement to determine what is an error and what is an extension. However, if an implementation is processing SQL language that contains no errors as far as that implementation is concerned, then it should be able to detect and flag all extensions at the same time.

f. In order to provide upward compatibility for its own customer base, or to provide performance advantages under special circumstances, a conforming SQL implementation may provide user options to process conforming SQL language in a nonconforming manner. If this is the case, then it is required that the implementation also provide a flagger option, or some other implementor defined means, to detect SQL conforming language that may be processed differently under the various user options. This flagger feature allows an application programmer to identify conforming SQL language that may perform differently in alternative processing environments provided by a conforming SQL implementation. It also provides a valuable tool in identifying SQL elements that may have to be modified if an application is to be moved from a nonconforming to a conforming SQL processing environment.

g. In certain circumstances (see paragraph 9c) an application programmer may choose to use a nonstandard language extension provided by an implementation (e.g., a COMPLEX data type for FORTRAN applications). It is required that the flagger detect all direct occurrences of such extensions. In addition, it is desirable (not required) that the flagger or the implementation provide support (e.g., a cross-listing of variables and database identifiers) for detecting all secondary references to such extensions. Secondary references may include variables, parameters, views, or other database identifiers that do not themselves violate syntax rules, but refer to an object that is or contains an extension. This additional feature would allow an application programmer to identify all SQL language occurrences that may have to be modified if an application is to be moved from a nonconforming to a conforming SQL processing environment.

**11. Implementation.** Implementation of this standard involves three areas of consideration: acquisition of FIPS SQL implementations, interpretation of FIPS SQL, and validation of FIPS SQL implementations.

#### **11.1 Acquisition of SQL Implementations.**

a. This publication is effective February 2, 1990. It is a revision of an existing FIPS that offers new conformance alternatives, a new integrity option, clarification and correction of existing specifications, and



additional considerations for use in procurements. It does not contain any new requirements that would make an existing conforming implementation nonconforming. No delayed effective date or transition period is necessary.

b. Relational model database management systems acquired for Federal use should implement FIPS SQL. Conformance to FIPS SQL should be considered whether SQL implementations are developed internally, acquired as part of an ADP system procurement, acquired by separate procurement, used under an ADP leasing arrangement, or specified for use in contracts for programming services.

**11.2 Interpretation of FIPS SQL.** NIST provides for the resolution of questions regarding FIPS SQL specifications and requirements, and issues official interpretations as needed. All questions about the interpretation of FIPS SQL should be addressed to:

Director  
National Computer Systems Laboratory  
ATTN: Database Language SQL Interpretation  
National Institute of Standards and Technology  
Gaithersburg, MD 20899  
Telephone: (301) 975-3251

**11.3 Validation of SQL Implementations.** A suite of automated validation tests for SQL implementations is currently available. It is planned that an enhancement of this test suite will be the basis of a future "certificate of validation" offered to implementations claiming conformance to this standard. For more information on SQL validation tests, or the availability of certificates of validation, contact:

Director  
National Computer Systems Laboratory  
ATTN: Software Standards Testing Program  
National Institute of Standards and Technology  
Gaithersburg, MD 20899  
Telephone: (301) 975-3258

**12. Waivers.** Under certain exceptional circumstances, the heads of Federal departments and agencies may approve waivers to Federal Information Processing Standards (FIPS). The head of such agency may redelegate such authority only to a senior official designated pursuant to section 3506(b) of Title 44, U.S. Code. Waivers shall be granted only when:

- a. Compliance with a standard would adversely affect the accomplishment of the mission of an operator of a Federal computer system, or
- b. Cause a major adverse financial impact on the operator which is not offset by Governmentwide savings.

Agency heads may act upon a written waiver request containing the information detailed above. Agency heads may also act without a written waiver request when they determine that conditions for meeting the standard cannot be met. Agency heads may approve waivers only by a written decision which explains the basis on which the agency head made the required finding(s). A copy of each such decision, with procurement sensitive or classified portions clearly identified, shall be sent to: National Institute of Standards and Technology; ATTN: FIPS Waiver Decisions, Technology Building, Room B-154; Gaithersburg, MD 20899.

In addition, notice of each waiver granted and each delegation of authority to approve waivers shall be sent promptly to the Committee on Government Operations of the House of Representatives and the Committee on Governmental Affairs of the Senate and shall be published promptly in the *Federal Register*.

When the determination on a waiver applies to the procurement of equipment and/or services, a notice of the waiver determination must be published in the *Commerce Business Daily* as a part of the notice of solicitation for offers of an acquisition or, if the waiver determination is made after that notice is published, by amendment to such notice.

A copy of the waiver, any supporting documents, the document approving the waiver and any supporting and accompanying documents, with such deletions as the agency is authorized and decides to make under 5 U.S.C. Sec. 552(b), shall be part of the procurement documentation and retained by the agency.

**13. Special Procurement Considerations.** FIPS SQL includes various alternatives for interfacing to programming languages, specifies "integrity enhancement" as an optional component of the standard, and does not specify any minimum requirements for the size or number of occurrences of database constructs. Any invocation of this standard in a procurement should indicate the programming languages to which it interfaces, whether direct invocation of SQL statements is required, whether module language, embedded SQL, or both are required for each language, whether the optional integrity feature is to be included, and what the sizing and occurrence requirements are. Any use of this standard in a broader database management system (DBMS) procurement should be accompanied with functional requirements for other DBMS components and facilities.

**13.1 Integrity Enhancement Feature.** References to this standard in a procurement should indicate whether or not the "integrity enhancement" feature (an optional component of X3.135-1989) is required. Failure to make this indication means that the feature is not required.

**13.2 Programming Language Interfaces.** References to this standard in a procurement should indicate which programming languages (e.g., Ada, C, COBOL, FORTRAN, or Pascal) are to be supported for language interface. Failure to make this indication means that support for any one of these languages satisfies the FIPS SQL requirement.

**13.3 Style of Language Interface.** References to this standard in a procurement should indicate, for each programming language identified above, whether the language interface is to support Module Language, Embedded SQL, or both. Failure to make this indication means that support for any one interface style satisfies the FIPS SQL requirement.

**13.4 Interactive SQL.** References to this standard in a procurement should indicate whether or not "direct invocation of SQL statements" is required and, if required, which SQL statements are to be directly invocable. Failure to make this indication means that direct invocation of SQL statements is not required. A requirement for direct invocation of SQL statements that fails to identify which statements are invocable means that interactive availability of the following statements satisfies the requirement:

CREATE TABLE statement  
 CREATE VIEW statement  
 GRANT privilege statement  
 INSERT INTO statement  
 SELECT statement, with ORDER BY instead of INTO  
 UPDATE statement: searched  
 DELETE statement: searched  
 COMMIT WORK statement  
 ROLLBACK WORK statement

In Interactive SQL, if a statement causes an exception resulting in a non-zero SQLCODE, then the system shall display a message indicating that the statement failed and should give a textual description of the failure. Also, in Interactive SQL, an implementation shall provide some implementor specified symbol for representing null values.

**13.5 Sizing for Database Constructs.** References to this standard in a procurement should indicate minimum requirements for the precision, size, or number of occurrences of database constructs. Failure to make this indication means that the values detailed below are by default the minimum requirements.

a) Length of an identifier	18
b) Length of CHARACTER type	240
c) Decimal precision of NUMERIC type	15
d) Decimal precision of DECIMAL type	15
e) Decimal precision of INTEGER type	9
f) Decimal precision of SMALLINT type	4
g) Binary precision of FLOAT type	20
h) Binary precision of REAL type	20
i) Binary precision of DOUBLE PRECISION type	30



j) Columns in a table	100
k) Values in an INSERT statement	100
l) Set clauses in an UPDATE statement	20
m) Length of a row (see Note 1)	2000
n) Column specifications in a UNIQUE constraint	6
o) Length of UNIQUE constraint (see Note 1)	120
p) Column specifications in a GROUP BY clause	6
q) Sort specifications in an ORDER BY clause	6
r) Referencing columns in a FOREIGN KEY	6
s) Table references in an SQL statement	10
t) Cursors simultaneously open	10

**Note 1:** The length of a collection of columns is defined to be the sum of: twice the number of columns, length of each character column, decimal precision plus 1 of each exact numeric column, binary precision divided by 4 plus 1 of each approximate numeric column.

**13.6 Character Data Values.** The set of character values for the character data type and the collating sequence of characters in SQL are both implementor-defined. References to this standard in a procurement should indicate any additional character data requirements. For example, applications running in a specific programming language environment may wish to specify that the SQL character values coincide with the character values and the collating sequence of that programming language. Failure to indicate specific character set requirements means that support for representation of the 95-character graphic subset of ASCII (FIPS PUB 1-2), in an implementor specified collating sequence, is by default the minimum requirement.

**13.7 DBMS Procurement.** Database software is normally purchased as a complete package called a database management system (DBMS). A DBMS is an implementation of one or more data models (e.g., the network model or the relational model), together with other components, features, or data interfaces for efficient data administration. These additional facilities are not specified by this standard, so each procurement should itself specify the functional requirements of each additional feature desired.

Additional facilities most often contained in a DBMS package include: schema manipulation, dynamic SQL, system catalog tables, special data types (e.g., date, time), database import and export tools, data dictionary, data storage specification, natural language query, report writer, query by forms, menu driven data access, application development system, graphics display, or upload and download between mainframes and workstations. Emerging specifications for an expanded SQL database language in ANSI and ISO standardization bodies may result in future standardization for some of these facilities; others may always remain implementation specific.

DBMS performance is often a critical factor in a DBMS procurement. This standard is silent on the topic of performance. The SQL test suite (see 11.3) also makes no attempt to test the performance aspects of a conforming system. Whenever performance requirements are known in advance, they may be included as an integral part of the procurement specification.

A DBMS may also provide additional data structures, such as indices, or software, such as query optimizers, to enhance performance. User requirements for monitoring database activity or tools for tuning database performance should be specified explicitly.

Some database management systems must operate in a highly secure environment that requires "trustworthy" database access control beyond the GRANT privilege facility and the VIEW definition capability specified in this standard. Procurements for systems that operate in these environments should include explicit additional requirements that must be supported.

**13.8 Integration.** In many cases a database or a database management system must be integrated with other information processing systems operating in the same environment. Examples of other systems might include: the operating system, document processing systems, engineering CAD/CAM systems, graphics systems, an information resource dictionary system, statistical analysis systems, a transaction processing system, or an artificial intelligence system. In addition, distributed data under the control of different vendor's database management systems may require integration into a coordinated global view through remote database access or open distributed processing. All such integration is beyond the scope of this standard and, if desired, must be specified explicitly as part of procurement requirements.



**14. Where to Obtain Copies.** Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. (Sale of the included specification documents, ANSI X3.135-1989 and ANSI X3.168-1989, is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 127-1 (FIPS PUB127-1), and title. Payment may be made by check, money order, or deposit account.









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**NIST**

**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Institute of Standards and Technology**  
Gaithersburg, Maryland 20899

June 15, 1993

**MEMORANDUM FOR Agency Senior Management Officials and  
Technical Contacts for ADP Standards**

*James H. Burrows*  
**From: James H. Burrows, Director**  
**Computer Systems Laboratory**

**Subject: Planned Federal Information Processing Standards (FIPS)**

Attached is a recent Federal Register notice that provides information on the status of planned, proposed, and completed Federal Information Processing Standards (FIPS). The FIPS planned for 1993-1994 will continue to support the development of open systems that are based on standards and that protect sensitive information. NIST is working with national and international standards organizations, industry consortia, and NIST-sponsored workshops to achieve off-the-shelf solutions that will work in a multi-vendor environment. FIPS that are proposed for Federal agency use will be sent to you for review and comments.

I thank you for your past interest, and invite your comments on our planned activities and your needs for future standards and guidelines.

Attachment  
DOC Semiannual Regulatory Agenda  
dtd 4/26/93





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Monday  
April 26, 1993

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**Part IV**

**Department of  
Commerce**

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**Semiannual Regulatory Agenda**



## DEPARTMENT OF COMMERCE (DOC)

## DEPARTMENT OF COMMERCE

## Office of the Secretary

## 13 CFR Ch. III

## 15 CFR Subtitle A; Subtitle B, Chs. I, II, III, VII, VIII, IX, XI, XII

## 19 CFR Ch. III

## 37 CFR Chs. I, IV, and V

## 48 CFR Ch. 13

## 50 CFR Chs. II, III, and VI

## Semiannual Agenda of Regulations

**AGENCY:** Office of the Secretary, Commerce.

**ACTION:** April 1993 regulatory agenda.

**SUMMARY:** In compliance with Executive Order (E.O.) 12291 entitled "Federal Regulation" and the Regulatory Flexibility Act (Pub. L. 96-354), the Department of Commerce, in April and October of each year, publishes in the *Federal Register* an agenda of the rulemaking actions covered by section 1 of E.O. 12291 that the Department plans to conduct or review over the next 12 months. Rulemaking actions are grouped according to prerulemaking, proposed rules, final rules, and rulemaking actions completed since the October 1992 agenda. The purpose of the agenda is to provide information to the public on regulations currently under review, being proposed, or issued by the Department. The agenda is intended to facilitate comments and views by interested members of the public.

The Department's April 1993 regulatory agenda includes regulatory activities that are expected to be conducted during the period April 1, 1993, through March 31, 1994.

**FOR FURTHER INFORMATION CONTACT:**

*Specific:* For additional information about specific regulatory actions listed in the agenda, contact the individual identified as the contact person.

*General:* Comments or inquiries of a general nature about the agenda should be directed to Michael A. Levitt, Assistant General Counsel for Legislation and Regulation, U.S. Department of Commerce, Washington, DC 20230; telephone: 202-482-0846.

**SUPPLEMENTARY INFORMATION:** E.O. 12291 requires all executive agencies to publish semiannually an agenda of those regulations that are under consideration pursuant to this order. By memorandum of December 9, 1992, the Office of Management and Budget (OMB) issued guidelines and procedures for the preparation and publication of the April 1993 Unified Agenda of Federal Regulations. E.O. 12291 and the OMB guidelines require that each agency's agenda report the following information on nonexempt regulatory activities being conducted or planned to be conducted by the agency during the 12-month period succeeding publication: The title of the regulation; the name, title, address, and phone number of an agency person who is knowledgeable about the regulation; whether the action is expected to have a significant economic impact on a substantial number of small entities and whether it will affect levels of government; the section(s) of the Code of Federal Regulations which will affect or be affected by the action; the section of the United States Code, Public Law, or Executive order that authorizes the action; an indication of whether or not the entry is a significant regulatory action included in the Administration's Regulatory Program and if the agency considers it a priority action; an abstract describing the problem the regulation addresses, alternatives to the regulation being considered, and potential costs and benefits of the action; legal deadline, if any; and a timetable of dates and, if available, *Federal Register* citations for past stages of the action. In addition, OMB requires that procurement-related regulatory actions include additional information on all actions that are covered by section 22 of the Office of Federal Procurement Policy Act Amendments of 1988. This information will be used by the Office of Federal Procurement Policy in preparing the "Procurement Regulatory Activity Report."

The Regulatory Flexibility Act requires agencies to prepare a regulatory flexibility analysis where there is a positive finding that a rule will have a significant economic impact on a substantial number of small entities. E.O. 12291 requires agencies to prepare a regulatory impact analysis for any regulation considered to be a "major rule" as defined in the order.

**Explanation of Information Contained in the Agenda**

Within the Department, the Office of the Secretary and various operating units may issue regulations. Operating units, such as the Economic Development Administration, the Bureau of Export Administration, the International Trade Administration, the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration (NOAA), and the Patent and Trademark Office, issue the greatest share of the Department's regulations.

A large number of regulatory actions reported in the agenda are proposed or final Federal Information Processing Standards (FIPS) issued by NIST under Public Law 100-235. FIPS consist of standards and guidelines to improve Federal Government use and management of computers and information technology. The standards, while often of great use to industry and the public, apply only to the Federal Government. In developing the standards and guidelines and in providing technical guidance and coordination to Federal agencies, NIST works closely with private industry standard-setting organizations.

Another large number of regulatory actions reported in the agenda deal with fishery management programs of NOAA's National Marine Fisheries Service (NMFS). To avoid repetition of programs and definitions, as well as to provide some understanding of the technical and institutional elements of the NMFS programs, a section on "Explanation of Information Contained in NMFS Regulatory Entries" is provided below.

**Explanation of Information Contained in NMFS Regulatory Entries**

The Magnuson Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801 *et seq.*) (Act) governs the management of fisheries within the Exclusive Economic Zone (EEZ). The EEZ refers to those waters from the outer edge of the State boundaries, generally 3 nautical miles, to a distance of 200 nautical miles. Fishery Management Plans (FMPs) are to be prepared for fisheries which require conservation and management measures. Regulations implementing these FMPs regulate domestic fishing and foreign fishing where permitted. Foreign fishing can be conducted in a

## DOC

fishery for which there is no FMP only if a preliminary fishery management plan has been issued to govern that foreign fishing. Under the Act, eight Regional Fishery Management Councils (Councils) prepare FMPs or amendments to FMPs for fisheries within their respective areas. In the development of such plans or amendments and their implementing

regulations, the Councils are required by law to conduct public hearings on the draft plans and to consider the use of alternative means of regulating.

The Council process for developing FMPs and amendments makes it difficult for NMFS to determine the significance and timing of some regulatory actions under consideration

by the Councils at the time the semiannual regulatory agenda is published.

The DOC April 1993 regulatory agenda follows.

Dated: February 23, 1993.

Carol C. Darr,  
Acting General Counsel.



DOC

## National Institute of Standards &amp; Technology—Proposed Rule Stage

Sequence Number	Title	Regulation Identifier Number
396	FIPS for POSIX System Administration .....	0693-AA71
397	FIPS for IRDS Export/Import File Format .....	0693-AA76
398	FIPS for Digital Signature Standard .....	0693-AA86

## DOC

## National Institute of Standards &amp; Technology—Proposed Rule Stage (Continued)

Sequence Number	Title	Regulation Identifier Number
399	Proposed Revision of FIPS 71-1, Advanced Data Communication Control Procedures (ADCCP) .....	0693-AA98
400	Proposed FIPS for ODA Raster DAP .....	0693-AB12
401	Revision of FIPS 177, Initial Graphics Exchange Specification (IGES) .....	0693-AB13
402	Proposed FIPS for Administration Standards for the Telecommunications Infrastructure of Federal Buildings .....	0693-AB14
403	National Voluntary Laboratory Accreditation Program .....	0693-AB15
404	Advanced Technology Program .....	0693-AB16
405	National Voluntary Conformity Assessment Systems Evaluation .....	0693-AB17

## National Institute of Standards &amp; Technology—Final Rule Stage

Sequence Number	Title	Regulation Identifier Number
406	Revision of FIPS 140, General Security Requirements for Equipment Using the Data Encryption Standard .....	0693-AA68
407	FIPS for POSIX Shell and Utility Application Interface for Computer Operating Systems Environments .....	0693-AA70
408	Fastener Quality .....	0693-AA90
409	Revision of FIPS 128, Computer Graphics Metafile (CGM) .....	0693-AA93
410	FIPS for Automated Password Generator .....	0693-AA94
411	Proposed FIPS for ISDN .....	0693-AA96
412	Proposed FIPS for Secure Hash Standard .....	0693-AA97
413	Proposed FIPS for Standard Security Label Format for GOSIP .....	0693-AA99
414	Proposed Revision of FIPS 125, MUMPS .....	0693-AB00
415	Proposed Revision of FIPS 151-1, POSIX .....	0693-AB01
416	Procedures for Registering Computer Security Objects .....	0693-AB02
417	FIPS for Standard Page Description Language .....	0693-AB03
418	Proposed Revision of FIPS 127-1, Database Language SQL .....	0693-AB05
419	FIPS for Integration Definition for Function Modeling (IDEFO) and Integration Definition for Information Modeling (IDEF1X) .....	0693-AB07
420	Proposed Reaffirmation of FIPS 46-1, Data Encryption Standard (DES) .....	0693-AB09
421	Proposed Revision of FIPS 158, the User Interface Component of the Applications Portability Profile .....	0693-AB10

## National Institute of Standards &amp; Technology—Completed Actions

Sequence Number	Title	Regulation Identifier Number
422	FIPS for Document Application Profile (DAP) for the Office Document Architecture (ODA) and Interchange Format Standard .....	0693-AA67
423	FIPS 179, Government Network Management Profile (GNMP) .....	0693-AA85
424	FIPS 177, Initial Graphics Exchange Specification (IGES) .....	0693-AA88
425	FIPS 178, Video Teleconferencing Services at 56 to 1,920 Kbps .....	0693-AB06

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**DEPARTMENT OF COMMERCE (DOC)****Proposed Rule Stage****National Institute of Standards & Technology (NIST)**

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**396. FIPS FOR POSIX SYSTEM  
ADMINISTRATION****Legal Authority:** PL 100-235**CFR Citation:** None**Legal Deadline:** None

**Abstract:** This standard will adopt a set of specifications on an interim basis to provide functional system administration requirements for POSIX operating system implementations. Actual utility names and options for system administration will be specified in a future revision to this FIPS. This standard will facilitate the interchange

of computer programs among different vendor systems and architectures.

**Timetable:** Next Action Undetermined**Small Entities Affected:** None**Government Levels Affected:** Federal**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151

Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA71

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**397. FIPS FOR IRDS EXPORT/IMPORT  
FILE FORMAT****Legal Authority:** PL 100-235**CFR Citation:** None**Legal Deadline:** None

**Abstract:** This standard will adopt an American National Standard being developed by Standards Committee X3H4. The standard will specify the



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## Proposed Rule Stage

precise format of files used to exchange information between IRDSs. The specification will complete the IRD-IRD Interface, the functionality of which is specified in FIPS PUB 156.

**Timetable:** Next Action Undetermined

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA76

### 398. FIPS FOR DIGITAL SIGNATURE STANDARD

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will specify a Digital Signature algorithm appropriate for digital signature applications. The standard will enable users to verify the integrity of the data and the origin of messages sent between computers, and to verify the integrity of data and programs that are stored in computers.

**Timetable:**

Action	Date	FR Cite
NPRM	08/30/91	56 FR 42980
NPRM Comment Period End	02/28/92	56 FR 61231
Second Comment Period End	04/00/93	
Final Action	09/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA86

### 399. PROPOSED REVISION OF FIPS 71-1, ADVANCED DATA COMMUNICATION CONTROL PROCEDURES (ADCCP)

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This revision will adopt revised international standards for data communications control procedures. This revision will facilitate the transfer and control of information across telecommunications links, and improve interoperability between different equipment and systems.

**Timetable:**

Action	Date	FR Cite
NPRM	06/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA98

### 400. • PROPOSED FIPS FOR ODA RASTER DAP

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will specify an interchange format suitable for the transfer of raster images between systems designed for raster graphics applications. The standard will enable users to transfer documents between different equipment designed for raster processing.

**Timetable:**

Action	Date	FR Cite
NPRM	08/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151

Technology, Gaithersburg, MD 20899  
301 975-2833

**RIN:** 0693-AB12

### 401. • REVISION OF FIPS 177, INITIAL GRAPHICS EXCHANGE SPECIFICATION (IGES)

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This revision will update FIPS 177 by adopting revised voluntary industry specifications for IGES. The revision will enable the Federal Government to maintain compatibility with industry practices for the representation and exchange of product definition data used in computer-aided design and computer-aided manufacturing systems.

**Timetable:**

Action	Date	FR Cite
NPRM	09/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AB13

### 402. • PROPOSED FIPS FOR ADMINISTRATION STANDARDS FOR THE TELECOMMUNICATIONS INFRASTRUCTURE OF FEDERAL BUILDINGS

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will adopt ANSI/TIA/EIA-606-1992, Administration Standard for the Telecommunications Infrastructure of Commercial Buildings. The standard will provide the administrative requirements for the telecommunications equipment spaces, cable pathways, grounding, wiring and termination hardware that support the distribution of information within a new, existing, or renovated office building or campus.



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## Timetable:

Action	Date	FR Cite
NPRM	05/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AB14

#### 403. • NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM

**Legal Authority:** 15 USC 271 et seq

**CFR Citation:** 15 CFR 7; 15 CFR 285

**Legal Deadline:** None

**Abstract:** The NVLAP procedures will be redesignated as part 285 of title 15 of the Code of Federal Regulations and revised to: expand the procedures to include accreditation of calibration laboratories; update the procedures for compatibility with conformity assurance and assessment concepts; assure consistency with relevant International Organization for Standardization (ISO) documents (e.g., ISO guides 25, 38, 43, 58, and 9000); and facilitate and promote acceptance of calibration and test results between countries to avoid barriers to trade. Provisions in this regard will facilitate cooperation between laboratories and other bodies to assist in the exchange of information and experience, harmonize standards and procedures, and establish the basis for bilateral and multilateral agreements.

## Timetable:

Action	Date	FR Cite
NPRM	05/00/93	

**Small Entities Affected:** Undetermined

**Government Levels Affected:** None

**Sectors Affected:** Multiple

**Agency Contact:** Albert Tholen, Chief, NVLAP, Department of Commerce, National Institute of Standards & Technology, TRF Bldg., Room A162, Gaithersburg, MD 20899, 301 975-4017

**RIN:** 0693-AB15

#### 404. • ADVANCED TECHNOLOGY PROGRAM

**Legal Authority:** PL 102-245

**CFR Citation:** 15 CFR 295

**Legal Deadline:** None

**Abstract:** The American Technology Preeminence Act of 1992 (Public Law 102-245), made changes in the legal authority for the Advanced Technology Program that must be incorporated into the ATP program procedures. Changes address: (1) participation by foreign companies in ATP; (2) the establishment of a patent policy different from the governmentwide policy set out by the Bayh-Dole Act; and (3) a new requirement that "joint research and development ventures" be industry-led. Further, requirements for royalty-sharing by ATP recipients with the Federal government for inventions funded under ATP have been repealed by the Act, and are thus to be removed from the regulations. Similarly, ATP authority to provide direct funding to independent research organizations has been repealed, and appropriate revisions to the regulations are needed. Also, changes not required by the Act will be proposed, including changes to simplify and clarify the selection criteria and to streamline the internal operations of ATP, including the selection process.

## Timetable:

Action	Date	FR Cite
NPRM	05/00/93	

**Small Entities Affected:** Undetermined

**Government Levels Affected:** None

**Sectors Affected:** Multiple

**Agency Contact:** George Uriano, Director, Advanced Technology Program, Department of Commerce, National Institute of Standards & Technology, Administration Bldg., Room A403, Gaithersburg, MD 20899, 301 975-5187

**RIN:** 0693-AB16

#### 405. • NATIONAL VOLUNTARY CONFORMITY ASSESSMENT SYSTEMS EVALUATION

**Legal Authority:** 15 USC 271 et seq

**CFR Citation:** 15 CFR 286

**Legal Deadline:** None

**Abstract:** The National Institute of Standards and Technology (NIST) will propose to establish the National Voluntary Conformity Assessment System Evaluation (NVCASE) Program. The program will enable the Department of Commerce, acting through NIST, to evaluate and recognize competently conducted conformity assessment activities. The results of NIST evaluations will provide a basis for the U.S. Government to assure foreign governments that qualified conformity assessment bodies are competent to satisfy their regulatory requirements. The program is complementary to those of other Federal agencies and is intended, together with those programs, to provide the basis for U.S. Government negotiations with foreign governments to gain their recognition of U.S.-based conformity assessment bodies as providing results acceptable for regulatory purposes. The program is intended to cover organizations engaged in product sample testing, product certification, and quality system registration and, most especially, their accreditors. NIST will offer its evaluations, based on publicly developed requirements, on a fee-for-service basis and will provide those meeting the requirements (cont)

## Timetable:

Action	Date	FR Cite
NPRM	05/00/93	

**Small Entities Affected:** Undetermined

**Government Levels Affected:** None

**Sectors Affected:** Multiple

**Additional Information:** ABSTRACT CONT: with a certificate of recognition. NIST will maintain lists of all recognized organizations and, in the case of recognized accreditation bodies, lists of conformity assessment bodies accredited by them.

**Agency Contact:** Stanley Warshaw, Director, Office of Standards Services, Department of Commerce, National Institute of Standards & Technology, Administration Building, Room A603, Gaithersburg, MD 20899, 301 975-4000

**RIN:** 0693-AB17



**DEPARTMENT OF COMMERCE (DOC)**  
**National Institute of Standards & Technology (NIST)**

Final Rule Stage

**406. REVISION OF FIPS 140,  
 GENERAL SECURITY REQUIREMENTS  
 FOR EQUIPMENT USING THE DATA  
 ENCRYPTION STANDARD**

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This revision will bring the standard up to date to cover new encryption applications, and new policies for testing for conformance to the standard.

**Timetable:**

Action	Date	FR Cite
ANPRM	12/09/88	53 FR 49722
ANPRM Comment Period End	03/09/89	53 FR 49722
NPRM	01/08/91	56 FR 681
NPRM Comment Period End	04/08/91	56 FR 681
Final Action	09/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AA68

**407. FIPS FOR POSIX SHELL AND  
 UTILITY APPLICATION INTERFACE  
 FOR COMPUTER OPERATING  
 SYSTEMS ENVIRONMENTS**

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This standard will adopt, on an interim basis, Draft 9 of the Institute of Electrical and Electronics Engineers (IEEE) Standard for Shell and Application Utility Interface for Computer Operating Systems Environments (IEEE 1003.2/POSIX Shell and Tools). This standard will extend the functionality of the POSIX standard by providing an interactive interface for users to control processing.

**Timetable:**

Action	Date	FR Cite
NPRM	06/07/89	54 FR 24375
NPRM Comment Period End	09/05/89	54 FR 24375

Action	Date	FR Cite
Repeated NPRM	06/13/90	55 FR 23959
NPRM Comment Period End	09/11/90	

Next Action Undetermined

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AA70

**408. FASTENER QUALITY**

Significance: Regulatory Program

Legal Authority: PL 101-592

CFR Citation: 15 CFR 280

Legal Deadline: NPRM, Statutory, May 15, 1991.

**Abstract:** This rule will implement the Fastener Quality Act. In 1990, Congress enacted the Fastener Quality Act (the Act) to protect public safety, deter introduction of nonconforming fasteners into commerce, improve traceability of fasteners used in critical applications, and provide customers with greater assurance that fasteners meet stated specifications. The Act requires that certain fasteners sold in commerce conform to the specifications to which they are represented to be manufactured; provides for accreditation of laboratories engaged in fastener testing; and requires the inspection, testing, and certification (in accordance with standardized methods) of fasteners used in critical applications.

**Timetable:**

Action	Date	FR Cite
NPRM	08/17/92	57 FR 37032
NPRM Comment Period End	11/02/92	57 FR 37032
Final Action	05/00/93	

Small Entities Affected: None

Government Levels Affected: None

**Agency Contact:** Stanley Warshaw, FQA Program Manager, Office of Standards Services, Department of Commerce, National Institute of Standards & Technology, Room A603

Administration, Gaithersburg, MD 20899, 301 975-4000

RIN: 0693-AA90

**409. REVISION OF FIPS 128,  
 COMPUTER GRAPHICS METAFILE  
 (CGM)**

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This revised FIPS will adopt the redesignated version of the CGM standard, known as ANSI/ISO 8632.1-4:1991, and add a requirement for the use of profiles. A profile defines the options, elements, and parameters of ANSI/ISO 8632 necessary to accomplish a particular function and to maximize the probability of interchange between systems implementing the profile. The revised FIPS will also adopt MIL-D-28003, Computer-Aided Acquisition and Logistics Support (CALS), as the first CGM Application Profile.

**Timetable:**

Action	Date	FR Cite
NPRM	11/26/91	56 FR 59928
NPRM Comment Period End	02/24/92	56 FR 59928
Second NPRM	05/26/92	57 FR 21961
Second NPRM Comment Period End	07/10/92	57 FR 21961
Final Action	05/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AA93

**410. FIPS FOR AUTOMATED  
 PASSWORD GENERATOR**

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This standard will provide an algorithm that will be implemented in software systems. The algorithm will generate pronounceable passwords for authenticating users of an ADP system.



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or for authorizing access to system resources.

**Timetable:**

Action	Date	FR Cite
NPRM	09/08/92	57 FR 40894
NPRM Comment	12/07/92	
Period End		
Final Action	05/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA94

**411. PROPOSED FIPS FOR ISDN**

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will define the generic protocols necessary to establish transparent Integrated Services Digital Network (ISDN) connections among government networks and between government and conformant common carrier networks. This standard will facilitate the interconnection of Federal telecommunications systems to standard ISDN services.

**Timetable:**

Action	Date	FR Cite
NPRM	01/13/92	57 FR 1255
NPRM Comment	04/13/92	57 FR 1255
Period End		
Final Action	05/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA96

**412. PROPOSED FIPS FOR SECURE HASH STANDARD**

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will adopt an algorithm which provides a formula for producing a numeric value (called a "message digest") of a message (or any digital information). This standard will be used whenever a secure hash algorithm is needed to provide a mechanism to check the integrity of data.

**Timetable:**

Action	Date	FR Cite
NPRM	01/31/92	57 FR 3747
NPRM Comment	04/30/92	57 FR 3747
Period End		
Final Action	05/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA97

**413. PROPOSED FIPS FOR STANDARD SECURITY LABEL FORMAT FOR GOSIP**

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This standard will specify the format for security labels to be used with the Government Open Systems Interconnection Profile (GOSIP). Security labels will facilitate the institution of controls to prevent accidental or intentional disclosure, modification, or destruction of data.

**Timetable:**

Action	Date	FR Cite
NPRM	08/21/92	57 FR 37948
NPRM Comment	11/19/92	
Period End		
Final Action	09/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of

Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA99

**414. PROPOSED REVISION OF FIPS 125, MUMPS**

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This revision will adopt American National Standard for MUMPS, ANSI/MDC X11.1-1990. This revision will facilitate the interchange of application programs among different computer systems and improve the productivity of computer programmers.

**Timetable:**

Action	Date	FR Cite
NPRM	05/26/92	57 FR 21963
NPRM Comment	08/24/92	57 FR 21963
Period End		
Final Action	05/00/93	

**Small Entities Affected:** None

**Government Levels Affected:** Federal

**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AB00

**415. PROPOSED REVISION OF FIPS 151-1, POSIX**

**Legal Authority:** PL 100-235

**CFR Citation:** None

**Legal Deadline:** None

**Abstract:** This revision will adopt International Standard ISO/IEC 9945-1: 1990, Information Technology - Portable Operating System Interface (POSIX) - Part 1: System Application Program Interface (API) (C Language), which defines a C programming language source interface to an operating system environment. This standard will facilitate the portability of application programs among different computer systems.



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## Timetable:

Action	Date	FR Cite
NPRM	06/29/92	57 FR 28829
NPRM Comment Period End	09/28/92	57 FR 28829
Final Action	05/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB01

## 416. PROCEDURES FOR REGISTERING COMPUTER SECURITY OBJECTS

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This register will specify names that uniquely identify Computer Security Objects (CSOs), which will be used to support secure communication of data between systems. The unique names will be used to reference objects during the negotiation of security services for a transaction or application. The register will also be a repository of parameters associated with the registered object.

## Timetable:

Action	Date	FR Cite
NPRM	08/11/92	57 FR 35787
NPRM Comment Period End	11/09/92	
Final Action	09/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB02

## 417. FIPS FOR STANDARD PAGE DESCRIPTION LANGUAGE

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This standard will adopt the International Standards Organization International Electrotechnical Commission Standard Page Description Language (SPDL), ISO/IEC/DIS 10180, which defines a device-independent format for representing documents in their final fully formatted form, to printers or other presentation processes. It combines the image description technology of modern page description languages with a document structure which enables efficient processing and page image management.

## Timetable:

Action	Date	FR Cite
NPRM	05/04/92	57 FR 19111
NPRM Comment Period End	08/03/92	57 FR 19111
Final Action	05/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB03

## 418. PROPOSED REVISION OF FIPS 127-1, DATABASE LANGUAGE SQL

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This revision to FIPS 127-1, Database Language SQL, will adopt the draft proposed American National Standard: Database Language SQL (dpANS X3.135-199X), which is expected to be approved as an American National Standard. This revision to FIPS 127-1 will provide a substantial, upward-compatible enhancement of Database Language SQL.

## Timetable:

Action	Date	FR Cite
NPRM	09/09/92	57 FR 41126

Action	Date	FR Cite
NPRM Comment Period End	12/08/92	57 FR 41126
Final Action	09/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB05

## 419. FIPS FOR INTEGRATION DEFINITION FOR FUNCTION MODELING (IDEFO) AND INTEGRATION DEFINITION FOR INFORMATION MODELING (IDEF1X)

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** Two FIPS will adopt non-proprietary IDEF modeling techniques developed by government and industry for use in the analysis and development of information systems. The first FIPS will adopt the IDEFO modeling methodology which produces a structured representation of the processes and functions carried out by an information system. The second FIPS will adopt the IDEF1X modeling methodology which produces an information model of the structure and semantics of the information used by a system.

## Timetable:

Action	Date	FR Cite
NPRM	12/14/92	57 FR 59081
Correction Notice	12/29/92	57 FR 61967
NPRM Comment Period End	03/15/93	57 FR 59081
Final Action	09/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

**Additional Information:** The December 14, 1992, Federal Register notice incorrectly listed RIN 0693-AB11 as the RIN for this action.

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151



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Technology, Gaithersburg, MD 20899,  
301 975-2833

RIN: 0693-AB07

#### 420. PROPOSED REAFFIRMATION OF FIPS 46-1, DATA ENCRYPTION STANDARD (DES)

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** A review will be conducted of Federal Information Processing Standard 46, Data Encryption Standard, which provides an algorithm to be implemented in electronic hardware devices and used for the cryptographic protection of computer data. The standard, which was issued in 1977 and reviewed in 1983 and 1987, will be reviewed again to assess the continued adequacy of the standard to protect computer data.

##### Timetable:

Action	Date	FR Cite
NPRM	09/11/92	57 FR 41727

Action	Date	FR Cite
NPRM Comment	12/10/92	
Period End		
Final Action	09/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirely Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB09

#### 421. PROPOSED REVISION OF FIPS 158, THE USER INTERFACE COMPONENT OF THE APPLICATIONS PORTABILITY PROFILE

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This revision will adopt the X Protocol, Xlib Interface, Xt Intrinsics

and Bitmap Distribution Format Specifications of the X Window System, Version 11, Release 5 (X Window System is a trademark of the Massachusetts Institute of Technology (MIT)). This standard will assist computing professionals involved in system and application software development and implementation.

##### Timetable:

Action	Date	FR Cite
NPRM	10/20/92	57 FR 47839
NPRM Comment	01/19/93	57 FR 47839
Period End		
Final Action	05/00/93	

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AB10

### DEPARTMENT OF COMMERCE (DOC)

### Completed Actions

#### National Institute of Standards & Technology (NIST)

#### 422. FIPS FOR DOCUMENT APPLICATION PROFILE (DAP) FOR THE OFFICE DOCUMENT ARCHITECTURE (ODA) AND INTERCHANGE FORMAT STANDARD

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This FIPS will be based on international standards for office document architecture and office document interchange formats. The profile will provide necessary functionality to enable documents developed on different manufacturers' equipment to be interchanged between systems.

##### Timetable:

Action	Date	FR Cite
NPRM	01/27/89	54 FR 4054
NPRM Comment	04/27/89	54 FR 4054
Period End		

Withdrawn - not in  
best interest of the  
Government to  
propose FIPS

Small Entities Affected: None

Government Levels Affected: None

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AA67

#### 423. FIPS 179, GOVERNMENT NETWORK MANAGEMENT PROFILE (GNMP)

Legal Authority: PL 100-235

CFR Citation: None

Legal Deadline: None

**Abstract:** This standard will specify a management protocol, management information, and management functions for interoperable multi-vendor networks that implement Open System Interconnection (OSI) standards. The standard will be based on the stable

agreements reached by NIST Workshop for Implementors of OSI as developed by the Special Interest Group on Network Management.

##### Timetable:

Action	Date	FR Cite
NPRM	07/31/91	56 FR 36136
Correction Notice	08/12/91	56 FR 38174
NPRM Comment	10/29/91	
Period End		
Final Action	12/14/92	57 FR 59085
Final Action Effective	06/14/93	57 FR 59085

Small Entities Affected: None

Government Levels Affected: Federal

Sectors Affected: 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

RIN: 0693-AA85

## DOC—NIST

## Completed Actions

**424. FIPS 177, INITIAL GRAPHICS EXCHANGE SPECIFICATION (IGES)****Legal Authority:** PL 100-235**CFR Citation:** None**Legal Deadline:** None

**Abstract:** This FIPS adopts the American National Standard Digital Representation for Communication of Product Definition Data, ASME/ANSI Y14.26M-1989, more commonly known as the Initial Graphics Exchange Specification (IGES). This FIPS establishes information structures for the digital representation and communication of product definition data and permits the compatible exchange of product definition data used by various computer-aided design and computer-aided manufacturing (CAD/CAM) systems.

**Timetable:**

Action	Date	FR Cite
NPRM	10/03/91	56 FR 50096
NPRM Comment Period End	01/02/92	56 FR 50096

Action	Date	FR Cite
Final Action	11/30/92	57 FR 56559
Final Action Effective	04/30/93	57 FR 56559

**Small Entities Affected:** None**Government Levels Affected:** Federal**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AA88**425. FIPS 178, VIDEO TELECONFERENCING SERVICES AT 56 TO 1,920 KB/S****Legal Authority:** PL 100-235**CFR Citation:** None**Legal Deadline:** None

**Abstract:** This standard adopts International Telegraph and Telephone Consultative Committee (CCITT) Recommendation H.320, H.221, H.242,

H.261, and H.230 for video teleconferencing and video telephony systems. This standard provides Federal departments and agencies with a comprehensive description of the interoperability criteria for audiovisual systems used in video teleconferencing and videophone applications.

**Timetable:**

Action	Date	FR Cite
NPRM	06/26/91	56 FR 29264
NPRM Comment Period End	09/24/91	56 FR 29264
Final Action	12/21/92	57 FR 60506
Final Action Effective	06/01/93	57 FR 60506

**Small Entities Affected:** None**Government Levels Affected:** Federal**Sectors Affected:** 357 Computer and Office Equipment

**Agency Contact:** Shirley Radack, Computer Specialist, Department of Commerce, National Institute of Standards & Technology, B151 Technology, Gaithersburg, MD 20899, 301 975-2833

**RIN:** 0693-AB06



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Wednesday  
June 2, 1993

National Institute of Standards and Technology  
NOTICES  
Information processing standards, Federal:  
Database language SQL, 31364

Journal of  
Federal  
Information  
Processing  
Standards

**National Institute of Standards and Technology**

[Docket No. 920772-3048]

RIN 0693-AB05

**Approval of Federal Information Processing Standards Publication 127-2, Database Language SQL**

**AGENCY:** National Institute of Standards and Technology (NIST), Commerce.

**ACTION:** The purpose of this notice is to announce that the Secretary of Commerce has approved a revision of Federal Information Processing Standard 127-1, Database Language SQL, which will be published as FIPS Publication 127-2. This publication announces adoption of American National Standard Database Language SQL, ANSI X3.135-1992, as the Federal Information Processing Standard for Database Language SQL (FIPS SQL). This revised standard supersedes FIPS 127-1 in its entirety.

**SUMMARY:** On September 9, 1992, notice was published in the *Federal Register* (57 FR 41126) that a revision of Federal Information Processing Standard 127-1, Database Language SQL, was being proposed for Federal use.

The written comments submitted by interested parties and other material available to the Department relevant to this standard were reviewed by NIST. On the basis of this review, NIST recommended that the Secretary approve the standard as a Federal Information Processing Standard (FIPS), and prepared a detailed justification document for the Secretary's review in support of that recommendation.

The detailed justification document which was presented to the Secretary is part of the public record and is available for inspection and copying in the Department's Central Reference and Records Inspection Facility, room 6020, Herbert C. Hoover Building, 14th Street between Pennsylvania and Constitution Avenues, NW., Washington, DC 20230.

This FIPS contains two sections: (1) An announcement section, which provides information concerning the applicability, implementation, and maintenance of the standard; and (2) a specifications section, which deals with the technical requirements of the standard. Only the announcement section of the standard is provided in this notice.

**EFFECTIVE DATE:** This standard is effective December 3, 1993.

**ADDRESSES:** Interested parties may purchase copies of this revised standard, including the technical specifications portion, from the National

Technical Information Service (NTIS). Specific ordering information from NTIS for this standard is set out in the Where to Obtain Copies Section of the announcement portion of the standard.  
**FOR FURTHER INFORMATION CONTACT:** Dr. Leonard Gallagher, National Institute of Standards and Technology, Gaithersburg, MD 20899, telephone (301) 975-3251.

Dated: May 26, 1993

**Raymond G. Kammer,**  
*Acting Director.*

**Federal Information Processing Standards Publication 127-2**

June 2, 1993.

Announcing the Standard for Database Language SQL.

Federal Information Processing Standards Publications (FIPS PUBS) are issued by the National Institute of Standards and Technology after approval by the Secretary of Commerce pursuant to section 111(d) of the Federal Property and Administrative Services Act of 1949 as amended by the Computer Security Act of 1987, Public Law 100-235.

1. Name of Standard. Database Language SQL (FIPS PUB 127-2).

2. Category of Standard. Software Standard, Database.

3. Explanation. This publication is a revision of FIPS PUB 127-1 and supersedes that document in its entirety. It provides a substantial, upward-compatible enhancement of Database Language SQL. It includes four levels of conformance: Entry SQL, ~~Transmittal~~ SQL, Intermediate SQL, and Full SQL. Entry SQL is a minor enhancement over the minimum requirements of FIPS PUB 127-1. Intermediate SQL is a major enhancement over Entry SQL, and Full SQL is a major enhancement over Intermediate SQL. Transitional SQL is a temporary FIPS specification that falls approximately half way between Entry SQL and Intermediate SQL.

Conformance to Entry SQL is required in all Federal procurements of SQL products. Conformance to Transitional SQL, Intermediate SQL, or Full SQL are options that may be specified, explicitly, as requirements in a Federal procurement. Section 13 identifies the minimum requirements for conformance to Entry SQL in FIPS PUB 127-2 that differ from the minimum requirements for conformance to FIPS PUB 127-1, and Section 14 defines requirements for the three additional levels of conformance.

This publication announces adoption of American National Standard Database

*Transitional*



Language SQL, ANSI X3.135-1992, as the Federal Information Processing Standard for Database Language SQL (FIPS SQL). The exact specification is in Section 10 of this standard.

ANSI SQL is a revision and replacement of two previous American National Standards, ANSI X3.135-1989 and ANSI X3.168-1989. It specifies the syntax and semantics of SQL language facilities for defining and accessing SQL databases. These facilities include:

- Schema definition, to declare the structures, integrity constraints, and access privileges of a database.
- Schema manipulation, to alter a schema definition.
- Data manipulation, to populate a database and access SQL-data.
- Transaction management, to define and manage SQL-transactions.
- Connection management, to establish and manage SQL-connections.
- Session management, to set the attributes of an SQL-session.
- Dynamic SQL, to provide facilities for dynamic construction and execution of SQL statements.
- Diagnostics management, to communicate constraint violations and warnings to applications.
- Information schema tables, to provide an SQL description of schema definitions.
- Programming language bindings, to declare database procedures that may be called from various programming languages.
- Embedded SQL, to define how SQL statements may be syntactically embedded into one of the following programming languages: Ada, C, COBOL, FORTRAN, MUMPS, Pascal, or PL/I. Embedded SQL was formerly defined in ANSI X3.168-1989.

ANSI SQL is specified in three levels: Entry SQL, Intermediate SQL, and Full SQL. Entry SQL is a minor enhancement of ANSI X3.135-1989 (see Section 13). Intermediate SQL adds provisions for schema manipulation, dynamic SQL, diagnostics management, long identifiers, multiple module support, cascade delete for referential integrity, multiple schemas per authorization identifier, DATE and TIME data types, domains, variable length character strings, support for national character sets, and substantial enhancements for data manipulation. The data manipulation enhancements in Intermediate SQL include: a CASE expression, CAST functions between data types, string operations, natural join, outer join, union join, row value expressions, and subqueries in value expressions, as well as table operations for union, intersection, and

complement. Full SQL adds provisions for connection management, session management, pre-defined character translations and form-of-use conversions, a BIT string data type, deferrable integrity constraints, derived tables in the FROM clause, subqueries in CHECK clauses, insensitive cursors, self-referencing data operations, assertions, and temporary tables. A list of optional FIPS SQL features, comprising all of the additional facilities in ANSI Intermediate SQL and Full SQL, is defined in Section 14 of this standard.

The purpose of FIPS SQL is to promote portability and interoperability of database application programs, to facilitate maintenance of database systems among heterogeneous data processing environments, and to allow for the efficient exchange of programmers among different data management projects. The standard is used by implementors as the reference authority in developing a FIPS conforming relational model database management system, with standard programming language interfaces to that database management system. The standard is used by application programmers to help write SQL conforming applications and by other computer professionals who need to know the precise syntactic and semantic rules of Database Language SQL.

4. Approving Authority. Secretary of Commerce.

5. Maintenance Agency. Department of Commerce, National Institute of Standards and Technology (Computer Systems Laboratory)

6. Cross Index.

a. American National Standard Database Language SQL, ANSI X3.135-1992 (revision of ANSI X3.135-1989 and replacement of ANSI X3.168-1989).

b. ISO/IEC 9075:1992, Database Language SQL (revision of ISO/IEC 9075:1989).

Note: Except for a different Foreword, Introduction, and Normative references, ANSI X3.135-1992 and ISO/IEC 9075:1992 are identical documents.

7. Related Documents.

a. Federal Information Resources Management Regulations (FIRMR) subpart 201.20.303, Standards, and subpart 201.39.1002, Federal Standards, April 1992.

b. Federal ADP and Telecommunication Standards Index, U.S. General Services Administration, Information Resources Management Service, October 1992 (updated periodically).

c. NIST, Validated Products List/Programming Languages, Database

Language SQL, Graphics, GOSIP, POSIX, Security; Judy B. Kailey, Editor, NISTIR 5103, issue No. 1, January 1993 (republished quarterly). Available by subscription from the National Technical Information Service (NTIS).

d. FIPS PUB 21-3, Programming Language COBOL, 1990.

e. FIPS PUB 69-1, Programming Language FORTRAN, 1985.

f. FIPS PUB 109, Programming Language Pascal, 1985.

g. FIPS PUB 119, Programming Language Ada, 1985.

h. FIPS PUB 125-1, Programming Language MUMPS, 1993.

i. FIPS PUB 160, Programming Language C, 1991.

j. FIPS PUB 146, Government Open Systems Interconnection Profile (GOSIP). A revision to FIPS PUB 146-1, including Remote Database Access (RDA) specifications, is planned for mid-1993. To be issued in conjunction with IGOSS.

k. IGOSS, Industry/Government Open Systems Specification, publication planned mid-1993. This specification will reference "stable agreements" from the NIST OSI Implementor's Workshop as of December 1992.

l. NIST SP 500-206, Stable Implementation Agreements for Open Systems Interconnection Protocols, Version 6, Edition 1, NIST Workshop for Implementors of Open Systems Interconnection, December 1992.

m. ISO/IEC 9579-1, Information Technology—Open Systems Interconnection—Remote Database Access—Part 1: Generic model, service, and protocol, document ISO/IEC JTC1/SC21 N7689, April 1993.

n. ISO/IEC 9579-2, Information Technology—Open Systems Interconnection—Remote Database Access—Part 2: SQL specialization, document ISO/IEC JTC1/SC21 N7703, April 1993.

o. ISO/IEC 10026, Information Technology—Open Systems Interconnection—Distributed Transaction Processing—Part 1: OSI TP Model, Part 2: OSI TP Service, Part 3: OSI TP Protocol Specification, International Standard, December 1992.

p. SQL Information Bulletin, Number 1, SQLIB-1, Interpretations of ANSI X3.135-1989, available from Global Engineering Documents, April 1991.

q. FIPS PUB 29-2, Interpretation Procedures for FIPS Software, 14 September 1987.

r. ISO 646, Information Processing—ISO 7-bit coded character set for information interchange, 2nd edition, Third Edition, December 1991.

s. ISO 4873, Information Processing—ISO 8-bit code for information



interchange—Structure and rules for implementation, Third Edition, 1991. Replaces ANSI X3.134.1, 8-bit ASCII.

t. ANSI/ISO 8859-1, Information processing—8-bit single-byte coded graphic character sets—Part 1: Latin alphabet No. 1, February 1987. Replaces ANSI X3.134.2 effective September 22, 1992.

u. ISO/IEC CD 11404, Information Technology—Programming Languages—Language Independent Data Types (CLID), document JTC1/SC22 N1305, December 1992.

8. Objectives. The FIPS for Database Language SQL permits Federal departments and agencies to exercise more effective control over the production, management, and use of the Government's information resources. The primary objectives are:

- To encourage more effective utilization and management of database application programmers by ensuring that skills acquired on one project are transportable to other projects, thereby reducing the cost of database programmer retraining.
- To reduce overall software costs by making it easier and less expensive to maintain database definitions and database application programs and to transfer those definitions and programs among different computers and database management systems, including replacement database management systems.
- To promote communication and interoperability among data installations conforming to FIPS SQL and related GOSIP communications standards.
- To reduce the cost of software development by achieving increased database application programmer productivity through the understanding and use of database methods employing standard structures and operations, standard data types, standard constraints, and standard interfaces to programming languages.
- To protect the software assets of the Federal government by ensuring to the maximal feasible extent that Federal database management system standards are technically sound and that subsequent revisions are compatible with the installed base.

Government-wide attainment of the above objectives depends upon the widespread availability and use of comprehensive and precise standard database management system specifications.

#### 9. Applicability.

9.1 Database Language SQL is one of the database language standards

provided for use by all Federal departments and agencies. These database language standards should be used for all computer database applications and programs that are either developed or acquired for government use. FIPS SQL is particularly well suited for use in database applications that employ the relational data model. The relational data model is appropriate for applications requiring flexibility in the data structures and access paths of the database. The relational data model is desirable where there is a substantial need for ad hoc data manipulation, and data restructuring, in addition to the need for access by static applications under production control.

9.2 FIPS SQL shall be used for relational database applications and programs when one or more of the following situations exist:

- It is anticipated that the life of the database application will be longer than the life of the presently utilized equipment or database management system, if any.
- The database application is under constant review for updating of the specifications, and changes may result frequently.
- The database application is being designed and developed centrally for a decentralized system that employs computers of different makes and models or database software acquired from a different vendor.
- The database application will or might be run under a database management system other than that for which the database application is initially written.
- The database application is to be understood and maintained by programmers other than the original ones.
- The database application is one part of a distributed application that requires exchange of data or interoperation of the various parts.
- The database application is or is likely to be used by organizations outside the Federal government (e.g., Federal government contractors, State and local governments, and others).

9.3 Nonstandard language features shall be used only when the needed operation or function cannot reasonably be implemented with the standard features alone. A needed language feature not provided by the FIPS database languages should, to the extent possible, be acquired as part of an otherwise FIPS conforming database management system. Although nonstandard language features can be very useful, it should be recognized that

their use may make the interchange of programs and future conversion to a revised standard or replacement database management system more difficult and costly.

9.4 Although this standard does not specifically address interactive database access through graphical user interfaces (GUI), the SQL statements specified by this standard are appropriate for such use. In a Client/Server environment, a GUI client may use SQL statements to access SQL conformant server databases.

9.5 Although this standard does not specifically address distributed database management systems on distributed database applications, the connection management statements defined in this standard may be used, along with facilities for remote database access (ISO/IEC 9579) and distributed transaction processing (ISO/IEC 10026), to access SQL-data at remote nodes in a distributed system and to present a global view to application programs.

9.6 Although this standard does not specifically address user-defined data types, class hierarchies, inheritance, polymorphism, or other features of object database management system, such capabilities are upward compatible extensions of this standard and may be specified in a future revision of FIPS SQL (see Section 16.8).

9.7 It is recognized that some programmatic requirements may be more economically and efficiently satisfied through the use of a database management system employing a different data model than those provided by the FIPS database languages or the use of a database management system that functionally conforms to a FIPS database language but does not conform to all other aspects of the FIPS. The use of any facility should be considered in the context of system life, system cost, data integrity, and the potential for data sharing.

9.8 Some programmatic requirements may be more economically and efficiently satisfied by the use of automatic program generators or by database access through other high-level language information processing systems. However, if the final output of a program generator or high-level language system is language that accesses a relational database, then that language shall conform to the conditions and specifications of SQL.

10. Specifications. FIPS SQL adopts all provisions of ANSI X3.135-1992, Database Language SQL, with the exceptions listed below:

a. FIPS SQL requires conformance to Entry SQL, Conformance to Transitional SQL, Intermediate SQL, or full SQL are



options that may be specified explicitly in SQL procurements (see Section 14).

b. FIPS SQL does not include PL/I language bindings, since PL/I is not a FIPS programming language.

c. FIPS SQL does not recognize conformance solely by "direct invocation and processing of SQL language" as specified in Subclause 23.2 of ANSI X3.135-1992, because direct invocation does not mandate all of the facilities desired in a FIPS SQL conforming product. Conformance to FIPS SQL requires a Module or Embedded SQL binding style to one or more FIPS programming languages.

d. FIPS SQL requires that the "SQL Flagger" be implemented in Entry SQL in addition to Intermediate SQL and FIPS SQL. This is because FIPS SQL has always included a flagger requirement, even from its first specification in 1987. For conformance to Entry SQL or Transitional SQL, FIPS SQL requires "Entry SQL Flagging" with the "Syntax Only" extent of checking option as defined in Subclause 4.33 of ANSI X3.135-1992. The SQL Flagger is required for each language binding style, including "Interactive Direct SQL" (see Section 16.5).

e. For conformance to Intermediate SQL or to Full SQL, FIPS SQL requires implementation of the following named character sets: SQL\_CHARACTER, ASCII\_GRAPHIC, LATIN1, ASCII\_FULL, and SQL\_TEXT. The form-of-use and default collation requirements for these character sets are defined in Section 16.7 of this standard.

f. For conformance to Intermediate SQL or to Full SQL, FIPS SQL requires implementation of the FIPS\_DOCUMENTATION schema, as specified in Section 15 of this standard.

11. Implementation. Implementation of this standard involves four areas of consideration: the effective date, acquisition of FIPS SQL implementations, interpretation of FIPS SQL, and validation of FIPS SQL implementations.

11.1 Effective Date. This publication is effective December 3, 1993. Prior to that date the requirements of FIPS PUB 127-1 apply to Federal SQL procurements. This delayed effective date is intended to give implementations that conform to FIPS PUB 127-1 time to make the enhancements necessary to enable conformance to Entry SQL (see Section 13). No further transitional period is necessary.

11.2 Acquisition of SQL Implementations. Relational model database management systems acquired for Federal use shall implement FIPS SQL. Conformance to FIPS SQL is

required whether SQL implementations are developed internally, acquired as part of an ADP system procurement, acquired by separate procurement, used under an ADP leasing arrangement, or specified for use in contracts for programming services. Recommended terminology for procurement of FIPS SQL is contained in the U.S. General Services Administration publication Federal ADP & Telecommunications Standards Index, Chapter 4 Part 1.

11.3 Interpretation of FIPS SQL. NIST provides for the resolution of questions regarding FIPS SQL specifications and requirements, and issues official interpretations as needed. Procedures for interpretations are specified in FIPS-PUB 29-2. All questions about the interpretation of FIPS SQL should be addressed to: Director, Computer Systems Laboratory, ATTN: Database Language SQL Interpretation, National Institute of Standards and Technology, Gaithersburg, MD 20899, Telephone: (301) 975-2833.

11.4 Validation of SQL Implementations. Implementations of FIPS SQL shall be validated in accordance with NIST Computer Systems Laboratory (CSL) validation procedures for FIPS SQL. Recommended procurement terminology for validation of FIPS SQL is contained in the U.S. General Services Administration publication Federal ADP & Telecommunications Standards Index, Chapter 4 Part 2. This GSA publication provides terminology for three validation options: Delayed Validation, Prior Validation Testing, and Prior Validation. The agency shall select the appropriate validation option and shall specify whether a Validation Summary Report or Certificate of Validation is required. The agency shall specify appropriate time frames for validation and correction of nonconformities. The agency is advised to refer to the NIST publication Validated Products List for information about the validation status of SQL products. This information may be used to specify validation time frames that are not unduly restrictive of competition.

The agency shall specify the criteria used to determine whether a Validation Summary Report (VSR) or Certificate is applicable to the hardware/software environment of the SQL implementation offered. The criteria for applicability of a VSR or Certificate should be appropriate to the size and timing of the procurement. A large procurement may require that the offered version/release of the SQL implementation shall be validated in a specified hardware/software environment and that the

validation shall be conducted with specified hardware/software features or parameter settings; e.g. the same parameter settings to be used in a performance benchmark. An agency with a single-license procurement may review the Validated Products List to determine the applicability of existing VSRs or Certificates to the agency's hardware/software environment.

Implementations shall be evaluated using the NIST SQL Test Suite, a suite of automated validation tests for SQL implementations. The NIST SQL Test Suite was first released in August 1988 to help users and vendors determine compliance with FIPS SQL. Version 3.0 of the test suite was released in January 1992, to be used for validating conformance to FIPS PUB 127-1 after July 1, 1992. It is expected that Version 4.0 of the test suite will be available in mid-1993, to be used for testing conformance to Entry SQL of FIPS PUB 127-2 after the effective date. The results of validation testing by the SQL Testing Service are published on a quarterly basis in the Validated Products List, available from the National Technical Information Service (NTIS).

Each release of the test suite has provided additional interfaces and test cases to increase the test suite's coverage of the SQL language. Version 3.0 of the NIST SQL Test Suite provides 11 test suite types (interfaces): Embedded (pre-processor) Ada, Embedded C, Embedded COBOL, Embedded FORTRAN, Embedded Pascal, module language Ada, module language C, module language COBOL, module language FORTRAN, module language Pascal, and Interactive Direct SQL. Version 3.0 does not include tests for Embedded MUMPS or module language MUMPS because the MUMPS programming language interface is not defined in FIPS 127-1; such tests may be available in Version 4.0 for testing of FIPS 127-2. There are additional tests in Version 3.0 for the Integrity Enhancement Feature, default database sizing constructs, and the FIPS Flagger requirement of FIPS 127-1.

An SQL Test Suite license includes all of the tests described above, documentation, and automatic notifications of approved changes to the SQL Test Suite for a six month period. A license for SQL Test Suite Version 3.0 is a necessary requirement for an organization that wishes to be tested by the NIST SQL Testing Service between July 1, 1992 and the effective date of FIPS 127-2.

Current information about the NIST SQL Validation Service and validation procedures for FIPS SQL is available



from: National Institute of Standards and Technology, Computer Systems Laboratory, Software Standards Validation Group, Building 225, room A266, Gaithersburg, Maryland 20899, (301) 975-2490.

12. **Waivers.** Under certain exceptional circumstances, the heads of Federal departments and agencies may approve waivers to Federal Information Processing Standards (FIPS). The head of such agency may redelegate such authority only to a senior official designated pursuant to section 3506(b) of title 44, U.S. Code. Waivers shall be granted only when:

a. Compliance with a standard would adversely affect the accomplishment of the mission of an operator of a Federal computer system, or

b. Cause a major adverse financial impact on the operator which is not offset by Government-wide savings.

Agency heads may act upon a written waiver request containing the information detailed above. Agency heads may also act without a written waiver request when they determine that conditions for meeting the standard cannot be met. Agency heads may approve waivers only by a written decision which explains the basis on which the agency head made the required finding(s). A copy of each such decision, with procurement sensitive or classified portions clearly identified, shall be sent to: National Institute of Standards and Technology; ATTN: FIPS Waiver Decisions, Technology Building, room B-154; Gaithersburg, MD 20899.

In addition, notice of each waiver granted and each delegation of authority to approve waivers shall be sent promptly to the Committee on Government Operations of the House of Representatives and the Committee on Governmental Affairs of the Senate and shall be published promptly in the Federal Register.

When the determination on a waiver applies to the procurement of equipment and/or services, a notice of the waiver determination must be published in the Commerce Business Daily as a part of the notice of solicitation for offers of an acquisition or, if the waiver determination is made after that notice is published, by amendment to such notice.

A copy of the waiver, any supporting documents, the document approving the waiver and any supporting and accompanying documents, with such deletions as the agency is authorized and decides to make under 5 U.S.C. 552(b), shall be part of the procurement documentation and retained by the agency.

(Section 13 through Section 16 of FIPS PUB 127-2 are not included in this announcement).

17. **Where to Obtain Copies.** Copies of this publication are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161, telephone 703-487-4650. (Sale of the included specification document, ANSI X3.135-1992, is by arrangement with the American National Standards Institute.) When ordering, refer to Federal Information Processing Standards Publication 127-2 (FIPS PUB 127-2), Database Language SQL. Payment may be made by check, money order, or deposit account.

[FR Doc. 93-12918 Filed 6-1-93; 8:45 am]

BILLING CODE 3510-CN-M